

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

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UNITED STATES PATENT AND TRADEMARK OFFICE

APR 28 2006

U.S. PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Ex parte CARLO PEREGO, STEFANO PERATELLO, PAOLO POLLESEL, SERGIO SGORLON, MARIA ANGELA MANTEGAZZA, and MASSIMO ROMAGNOLI

Appeal No. 2006-0545  
Application No. 10/019,273

HEARD: March 08, 2006

Before GARRIS, WALTZ and JEFFREY T. SMITH, Administrative Patent Judges.  
JEFFREY T. SMITH, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on appeal from the examiner's final rejection of claims 1 to 14 and 17 to 20. We have jurisdiction under 35 U.S.C. § 134.

### BACKGROUND

The present invention relates to a process for the production of propylene comprising contacting a mixture of hydrocarbons with a catalyst composition under cracking conditions, thereby producing a product comprising propylene. Representative claims 1 and 20, as presented in the appendix to the Brief, appear below:

1. A process for the production of propylene comprising contacting a mixture of hydrocarbons with a catalyst composition under cracking conditions, thereby producing a product comprising propylene from said mixture,

wherein the mixture of hydrocarbons comprises predominately olefins, the mixture has a boiling point ranging from -15°C to +80°C, the catalyst composition comprises a large pore zeolite comprising a lattice of 12 tetrahedrons, and the zeolite has a molar ratio of silica/alumina from 100 to 200.

20. A process for the production of propylene comprising contacting a mixture of hydrocarbons with a catalyst composition under cracking conditions, thereby producing a product comprising propylene from said mixture,

wherein the mixture of hydrocarbons comprises predominately olefins, the mixture has a boiling point ranging from -15°C to +80°C, the catalyst composition comprises a large pore zeolite comprising a lattice of 12 tetrahedrons, and the zeolite has a molar ratio of silica/alumina less than 200; and

wherein the zeolite is prepared by the steps comprising:

contacting sodium aluminate with an aqueous solution of tetramethylammonium hydroxide to form a mixture,

contacting the mixture with colloidal silica to form a homogeneous gel,

crystallizing the gel under hydrothermal conditions to obtain a first solid,

washing the first solid with water to form a second solid,

calcining the second solid in air to form a calcined solid,

subjecting the calcined solid to an ion exchange using an aqueous solution of ammonium acetate to form a third solid, and

calcining the third solid in air.

The Examiner cited the following references in rejecting the appealed claims:

Rosinski et al. (Rosinski)	3,832,449	Aug. 27, 1974
Leyshon et al. (Leyshon)	5,026,936	Jun. 25, 1991

The Examiner entered the following rejections (Answer, pp. 3-5):

Claims 17-19 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Claims 17-20 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to satisfy the written description requirement thereof.

Claims 1-14 and 17-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Leyshon and Rosinski.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the Appellants regarding the above-noted rejections, we make reference to the Answer (mailed October 19, 2005) for the Examiner's reasoning in support of the rejections, and to the Brief (filed August 8, 2005) and the Reply Brief (filed November 8, 2005) for the Appellants' arguments there against.

We reverse the § 112 rejections. We reverse the § 103 rejection of claim 13. We affirm the § 103 rejection of claims 1-12, 14, and 17-20. Our reasons follow.

#### OPINION

##### Rejection under § 112, first paragraph

The Examiner has rejected claims 17-20 as unpatentable under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. We reverse.

With regard to written descriptive support, all that is required is that Appellants' specification reasonably convey to one of ordinary skill in the art that as of the filing date of the application, appellants were in possession of the presently claimed invention; how the specification accomplishes this is not material. See *In re Kaslow*,

707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); *In re Edwards*, 568 F.2d 1349, 1351- 2, 196 USPQ 465, 467 (CCPA 1978).

"[T]he PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims." *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976). "Precisely how close the original description must come to comply with the description requirement of § 112 must be determined on a case by case basis." *Vas Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991). The Examiner (Answer, pages 2-3) urges that the specification does not provide adequate description of a composition maintaining catalytic activity for 25 hours or more (Claims 17-19). In particular, the Examiner asserts the word "more" provides an infinite time period which was not clearly disclosed in the instant specification.

The Examiner's position is not persuasive. As correctly noted by Appellants, the original disclosure in Figure 1 describing catalytic activity present at least until 140 hours of tos (time on stream) adequately describes the claimed subject matter. The determination of catalytic activity for 25 hours or more without the restraint of a specific numerical upper time limit is clearly conveyed by original disclosure. While it is recognized that no upper limit for the determination of catalytic activity is recited in the rejected claim, the determination of catalytic activity without the restraint of an upper

time limit would have been conveyed by the original disclosure to one of ordinary skill in the art. Consequently, the Examiner's rejection under 35 U.S.C. §112, first paragraph of claims 17-19 are reversed.

Regarding the subject matter of claim 20, the Examiner asserts that the specification supports only a method of making ZSM-12, not any unspecified catalyst as recited in the claim. (Answer, p. 2).

The Examiner's position is not persuasive. As correctly noted by Appellants, the specification discloses the preparation of ZSM-12 that is a species of a large-pore zeolite, i.e., a zeolite having a lattice consisting of 12 tetrahedrons. (Brief, p. 10). The Examiner has not explained why the description in the specification is not sufficient that a person of ordinary skill in the art would not understand that Appellants were in possession of the presently claimed invention. Consequently, the Examiner's rejection under 35 U.S.C. §112, first paragraph, of claim 20 is reversed.

**Rejection under § 112, second paragraph**

The Examiner has rejected claims 17-19 under 35 U.S.C. § 112, second paragraph, as indefinite. We reverse.

The Examiner asserts the language "25 hours or more" is indefinite since it is unclear how long the word "more" is intended to cover.

Appellants assert that the plain language of the phrase “25 hours or more” is intended to cover an unlimited period, or at least as long as the composition maintains catalytic activity. (Brief, p. 10).

“The legal standard for definiteness [under the second paragraph of 35 U.S.C. § 112] is whether a claim reasonably apprises those of [sic; ordinary] skill in the art of its scope.” *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The inquiry is to determine whether the claim sets out and circumscribes a particular area with a reasonable degree of precision and particularity. The definiteness of the language employed in a claim must be analyzed not in a vacuum, but in light of the teachings of the particular application. *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). After consideration of the present record, we determine that a person of ordinary skill in the art would have recognized that the disputed claim language covers the time period greater than 25 hours and for at least as long as the composition maintains catalytic activity. As such, the Examiner’s rejection on this basis is reversed.

**The Rejection under § 103 over Sang**

Claims 1-14 and 17-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Leyshon and Rosinski.<sup>1</sup>

The Examiner has determined that the claimed invention would have been obvious to a person of ordinary skill in the art from the combined teaching of Leyshon and Rosinski. In particular, the Examiner determined that Leyshon discloses a process of cracking an olefinic feedstock, such as, hexene into propylene in the presence of a catalyst containing ZSM-12 zeolite and Rosinski discloses a ZSM-12 that has a silica/alumina ratio of from 20-100. (Answer, pp. 3-4).

Appellants argue that Leyshon is so broad, as not being sufficient to present a *prima facie* case of obviousness. In particular, Appellants argue that it is only with the present disclosure as a guide that one skilled in the art would choose the ZSM-12 catalyst of Rosinski having the claimed SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio in the process of Leyshon since Leyshon is not limited to a particular zeolite catalyst. (Brief, p. 7). Appellants also argue that Leyshon prefers the ZSM-5 catalyst over the ZSM-12 catalyst. (Brief, p. 8).

Appellants' arguments are unpersuasive. A reference is available for all that it teaches to a person of ordinary skill in the art. *In re Inland Steel Co.*, 256 F.3d 1354,

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<sup>1</sup> Appellants have presented separate arguments for claims 3, 4, 13, 14, 17-19 and 20. These claims will be addressed separately to the extent that Appellants have argued them. The remaining claims are grouped with claim 1 for patentability.

1356, 60 USPQ2d 1396, 1401, 1402 (Fed. Cir. 2001); *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989) ("the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.") (quoting *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976)). Leyshon's preference for a ZSM-5 catalyst does not detract from the teaching that a ZSM-12 catalyst is also suitable. This is especially true because the catalyst is used for the identical purpose taught by the prior art. See *In re Corkill*, 771 F.2d 1496, 1500, 226 USPQ 1005, 1008 (Fed. Cir. 1985) (obviousness rejection of claims affirmed in light of prior art teaching that "hydrated zeolites will work" in detergent formulations, even though "the inventors selected the zeolites of the claims from among 'thousands' of compounds"); *In re Susi*, 440 F.2d 442, 445, 169 USPQ 423, 425 (CCPA 1971) (obviousness rejection affirmed where the disclosure of the prior art was "huge, but it undeniably include[d] at least some of the compounds recited in appellant's generic claims and it is of a class of chemicals to be used for the same purpose as appellant's additives").

Appellants argue that Leyshon requires an additional methathesis reaction to provide adequate propylene yields. (Brief, pp. 7-8). This argument is not persuasive of patentability. Claim 1 is not limited to a single reactive step. Specifically, claim 1

utilizes the term "comprising" as a transitional term, thus, opening the claim to the recited steps and any other steps such as an additional methathesis reaction. See *Vehicular Techs. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 1383, 54 USPQ2d 1841, 1845 (Fed. Cir. 2000); and *Molekulon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1271, 229 USPQ 805, 812 (Fed. Cir. 1986).

The Appellants assert that the specification contains comparative data demonstrating both the significance of the molar ratio of silica/alumina, when using a ZSM-12 catalyst, and a ZSM-12 catalyst compared to a ZSM-5 catalyst. Specifically, Appellants assert:

Example 3 demonstrates catalytic testing of a ZSM-12 zeolite having a molar ratio  $\text{SiO}_2/\text{Al}_2\text{O}_3$  of 100. Comparative Example 4 is otherwise similar but employs a molar ratio  $\text{SiO}_2/\text{Al}_2\text{O}_3$  of 250. The results for total conversion and selectivity to propylene are shown for Example 3 and Comparative Example 4 in Figures 1 and 2, respectively. The differences in results are manifest. For Example 3, and as described in the specification at page 12, lines 15-19, the total conversion and selectivity to propylene are high and remain steady for a time on stream (tos) of a least 140 hours, thus demonstrating unexpected stability and no catalytic deterioration phenomena during this time. For Comparative Example 4, on the other hand, and as described in the specification at page 15, lines 5-12, contrary to what is specified in the literature, the catalytic performance of ZSM-12 with a molar ratio  $\text{SiO}_2/\text{Al}_2\text{O}_3$  of 250 is lower both in terms of yield and duration, with respect to the zeolite having a greater content of  $\text{Al}_2\text{O}_3$ , and already after 25 hours of tos, evident catalytic deterioration phenomena are present.  
(Brief, p. 5).

Appellants assert that claims 3 and 4 are separately patentable because the data have been shown specifically with ZSM-12 zeolite. (Brief, p. 8). Appellants assert that claim 14 is separately patentable because actual data has been shown with the particular molar ratio of this claim. (Brief, p. 9). We do not agree. Leyshon discloses a process of cracking an olefinic feedstock in the presence of a catalyst containing ZSM-12 zeolite. A person of ordinary skill in the art would have recognized the ZSM-12 catalyst having a silica/alumina ratio of 100 is suitable for such a process from the teachings of Rosinski. The rejection of claims 3-4 and 14 is affirmed.

Appellants' arguments regarding claims 17-19 (Brief, p. 9) are not persuasive. The maintenance of catalytic activity as specified in the claims is a property of the particular catalyst. A person of ordinary skill in the art would have recognized that a ZSM-12 catalyst having a silica/alumina ratio of 100 is suitable for the process of Leyshon from the teachings of Rosinski. Thus, the rejection of claims 17-19 is affirmed.

Appellants assert that claim 20 is separately patentable, since the applied prior art neither discloses nor suggests preparing a zeolite having a molar ratio of silica/alumina less than 200 by the particular steps recited therein. Appellants' arguments are not persuasive for the reasons presented above and in the Answer. Contrary to Appellants' arguments, Rosinski discloses a ZSM-12 that can have a silica/alumina ratio of 100. The Examiner recognized that Rosinski does not disclose

using tetramethylammonium hydroxide in the place of tetraalkylammonium hydroxide in the process of forming ZSM-12. However, the Examiner determined that the use of tetramethylammonium hydroxide would have been obvious. (Answer, p. 7). Appellants have failed to specifically address the Examiner's position in responsive briefing.

Appellants assert that claim 13 is separately patentable because Rosinski directs persons skilled in the art to a particularly preferred molar ratio of 90-100 and away from the molar ratio of the claim. Claim 13 describes the molar ratio of silica/alumina ranging from 150 to 200. The Examiner has failed to identify the portion of the Leyshon and Rosinski references that discloses or suggests the claimed molar ratio. The Examiner has not adequately explained how the Rosinski disclosure of a ZSM-12 that having a silica/alumina molar ratio range of 20-100 suggests the claimed molar ratio of silica/alumina ranging from 150 to 200. The Examiner has also failed to identify why the claimed molar ratios would have been obvious. Thus, the Examiner has failed to establish a *prima facie* case. The rejection of claim 13 is reversed.

#### CONCLUSION

The rejections under § 112, first and second paragraphs, are reversed. The § 103 rejection of claim 13 over Leyshon and Rosinski is reversed. The § 103 rejection of claims 1-12, 14, and 17-20 over Leyshon and Rosinski is affirmed.

### **TIME FOR TAKING ACTION**

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

**AFFIRMED-IN-PART**

Bradley R Morris

**BRADLEY R. GARRIS**  
**Administrative Patent Judge**

*Thomas A. Waltz*  
THOMAS A. WALTZ  
Administrative Patent Judge

**THOMAS A. WALTZ  
Administrative Patent Judge**

  
JEFFREY T. SMITH  
Administrative Patent Judge

**JEFFREY T. SMITH  
Administrative Patent Judge**

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